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Docket No.: 0641-0255P  
(PATENT)  
**Box AF**  
**REPLY BRIEF**  
**EXPEDITED PROCEDURES EXAMINING**  
**GROUP 1762**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Walter H. Berryman

Application No.: 10/694,888

Confirmation No.: 4133

Filed: October 29, 2003

Art Unit: 1792

For: CIRCUIT INCLUDING A TITANIUM  
SUBSTRATE

Examiner: Brian K. Talbot

**REPLY BRIEF UNDER 37 C.F.R. § 41.41**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Appellant hereby replies to the Examiner's Answer dated March 4, 2008.

1. Initially Appellant notes that the Examiner's Answer incorrectly states that the only evidence relied on are three patent documents listed on page 3 of the Examiner's Answer. Appellant respectfully disagrees with this statement because the evidence of record includes evidence in the form of samples, marked specimens A, B, C and D, and filed as a single attachment to the Amendment filed on March 23, 2007 in a plastic bag with a sealing strip and with a label indicating the Application No., the Attorney's Docket Number, filing date, and this law firm's name and address, and a legend indicating that the contents are Specimens A, B, C

and D, as recommended in MPEP § 608(a). Specimen A comprises a titanium blank substrate (3 up size), specimen B comprises a titanium completed substrate with one glass (sacrificial) layer on the back, seven separately fired glass layers on the front, two separately fired conductor layers on the front and many resistor, thermistor and strain element ink prints with one firing process on the front. Specimens C and D comprise titanium bent substrates that are only partially coated. These specimens are located in the USPTO. They have been entered in the record, as noted in paragraph No. 10 of the Advisory Action, dated April 13, 2007.

Further, in this regard, Appellant notes that, although Appellant relied on these specimens in traversing the final rejections of the claims in issue, and in the Appeal Brief, the Examiner's Answer completely fails to address this evidence and Appellant's arguments based on this objective factual evidence.

For this reason alone, the Examiner's Answer is fundamentally improper, denying Appellant fundamental substantive and procedural due process required by the Administrative Procedures Act, and is a tacit admission that Appellant's arguments based on this evidence are proper and the final rejections are without merit and should be reversed.

2. The Examiner's Answer agrees in part that the prior art, e.g., DE 383598, fails to disclose controlling bending by controlling processing parameters of thickness and coefficient of expansion, but does choose its processing parameters to "achieve the desired result." Unfortunately, the Examiner's Answer completely fails to explain what these unspecified "processing parameters" of Zimmerman are, or how they relate to the claimed processing parameters of the glassy dielectric layer applied to the substrate, the composition and layer thickness of which are selected according to its temperature coefficients and Young's modulus to

substantially prevent bending of the substrate after it has cooled to ambient temperature.

In other words, the Examiner's Answer leaves to speculation what Zimmerman's processing parameters are and how they relate to the claimed processing parameters, leading to the conclusion that the rejection is too vague and indefinite as to be meaningful or proper. For this additional reason, the rejections of record based on Zimmerman are improper and without merit.

The Examiner's Answer also contends that Zimmerman's "desired result" is "a final product that does not suffer from distortion or warping," which is said to be as depicted in the drawings of DE 383598.

Appellant has continually argued that there is no objective factual basis in Zimmerman for this conclusion, such a feature clearly not being explicitly disclosed by Zimmerman, and such a feature not being inherently, i.e., necessarily, disclosed. The Examiner's Answer cannot point to any objective factual evidence in Zimmerman to support this conclusion and, instead, simply speculates that the drawing shows such a feature. This shortcoming of the Examiner's Answer demonstrates that the rejections of record and the Examiner's Answer are contrary to the established case law cited in the Appeal Brief, which clearly states that a rejection under 35 USC § 103 cannot be based on speculation but must be supported by objective factual evidence. The Examiner's Answer does not even attempt to rebut this case law. Instead, it just ignores it.

Moreover, the Examiner's Answer does not state the credentials of the Examiner in metallurgical microscopy, nor present a text that would support its conclusion as to what is or is not shown in Zimmerman's drawings regarding distortion. Nor does the Examiner's Answer even comment on the objective factual evidence submitted by Appellant regarding the specimens

filed by Appellant, which are objective factual evidence in support of Appellant's assertion. Furthermore, the Examiner's Answer completely fails to address, let alone rebut, Appellant's assertions in the Appeal Brief that Figures 1 and 2 of the drawings in cited DE 3838598 depict a cross-sectional view of a thick film electronic circuit on a metal substrate 1. The dimensions of the circuit are not indicated in the document. However, having regard to circuits of this kind the horizontal dimension of the drawings in Figures 1 and 2 is unlikely to exceed 0.3mm. The scale of the drawings in Zimmermann is such that the degree of bending or warping is unlikely to be evident. This may be seen by examining the two specimens C and D on a scale similar to Zimmermann. This is equivalent to viewing the specimens through a narrow slit that is at most 0.3mm wide. Even if such a narrow slit was placed over the specimens at a point of maximum bending gradient, the bending or warping (clearly evident in specimens C and D) would not be visible in such a narrow view. Thus, substrate bending that is sufficient to prevent further printing could not be seen on the drawings shown. In any event, the drawings in Zimmermann appear to be quite stylized or idealized as is common with diagrammatic cross-sections of integrated circuits and similar products in order to make the layer structure more clear. In this regard, it should also be kept in mind that the principal purpose of the drawings in Zimmermann is to show the relationship between a metallic substrate (1) and the various layers that are applied to the substrate in the disclosed process for manufacturing a thick-film electronic circuit. The fact that the drawings in Zimmermann do not show bending can be interpreted in one of two ways. Either Zimmermann did not consider bending to be an issue and has not addressed this problem, or alternatively, Zimmermann solved the bending problem but did not consider disclosing it in his text. In either event, there appears to be little evidence that Zimmermann has

“achieved” the desired result, being a final product that does not suffer from distortion/bending or warping.

Appellant respectfully submits this failure to address Appellant’s aforementioned evidence and arguments based on that evidence is a tacit admission that this rejection is improper and should be reversed.

3. Furthermore, with reference to page 6 of the Examiner’s Answer, the Examiner’s Answer indicates that the claim language “upon at least one surface of said substrate” includes within its scope the first glass-ceramic layer that is “directly” attached to the substrate as well as a second glass-ceramic layer that is attached to the substrate via first layer, the burden of proof has not been discharged, inter alia, because by firing the first insulating layer in an inert atmosphere, Zimmermann clearly wastes an opportunity to promote oxidation of the upper surface of the substrate which could in turn promote a strong bond (with lead diffusion). The fact that Zimmermann inhibits such oxidizing of the upper surface of the substrate by firing the first layer in an inert atmosphere, casts doubt on the Examiner’s assumption that Zimmermann teaches a product that does not suffer from distortion/bending or warping. Moreover, as noted above, the Examiner has not addressed the concern that the drawings in Zimmermann are close-up views that would not show warping/bending even if it was inherent in Zimmermann’s approach.

4. With respect to page 7 of the Examiner’s Answer concerning motivation to combine Sreeram with the primary references, Appellant respectfully submits that the Examiner’s Answer completely fails to address what is positively recited in claim 3, i.e., a

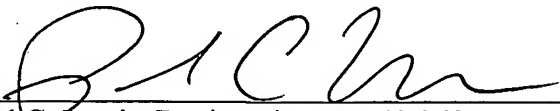
method including the step of diffusing the lead through titanium oxides on the or each surface of said substrate to form a relatively strong bond between said substrate and the dielectric layer immediately adjacent to it. Neither Zimmerman nor Sreeram discloses this diffusion step. Merely adding lead as suggested in the rejection ,is not the same as the positively recited step of diffusing the lead through titanium oxides on the or each surface of said substrate to form a relatively strong bond between said substrate and the dielectric layer immediately adjacent to it, as claimed.

### CONCLUSION

The final Office Action fails to make out a *prima facie* case of unpatentability under 35 USC § 103(a) of pending claims 1-4, 6 and 8-12 , and the outstanding rejections of these claims should be reversed.

Dated: April 4, 2008

Respectfully submitted,

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